Transitioning from the Indiana Academic Standards (IAS)
to the Common Core State Standards (CCSS):
Instructional and Assessment Guidance
(Mathematics – Updated April 2012)

Opportunity to Learn

Since the adoption of the Common Core State Standards, Indiana educators have been transitioning to the CCSS. From an assessment perspective, transitioning to the CCSS necessitates a focus on "Opportunity to Learn" for students. Opportunity to Learn (OTL) refers to equitable conditions or circumstances within the school or classroom that promote learning for all students. OTL includes curricula, learning materials and instructional experiences. In short, OTL supports student success by ensuring student access to both content and instruction.

Opportunity to Learn is both a **moral imperative** and an **ethical responsibility** on the part of educators. "Using OTL standards as a guide, students can measure whether they have a realistic shot at learning the subjects the state requires and whether they will have a fair chance to compete for college," (UCLA's Institute for Democracy, Education, & Access, 2003).

Indiana teachers have a two-fold obligation with regard to OTL. First, teachers must provide students with OTL for Indiana Academic Standards and Indicators that are assessed in the classroom and on ISTEP+. Second, and just as important, teachers must provide OTL in terms of the CCSS content that students must learn in preparation for college and careers, as measured by the new CCSS assessments. In considering the latter, teachers must acknowledge that important consideration must be given to specific indicators over the course of the next few years that might otherwise go untaught unless consciously integrated into instruction.

Assessing Student Learning

In an effort to empower teachers and assist with the transition to CCSS, the Office of Student Assessment has created "Assessment Guidance" documents for grades 3-8. All of the Indiana Academic Standards and Indicators represent valuable content, and a number of those Indicators are assessed on ISTEP+. Other Indicators are best assessed in the classroom through a variety of assessment methods, including teacher observation, student presentations, and teacher-developed quizzes and tests. The Indicators assessed on ISTEP+ are identified on the documents with a "✓+"and a "✓"; those assessed in the classroom are acknowledged with a clipboard symbol (📋).

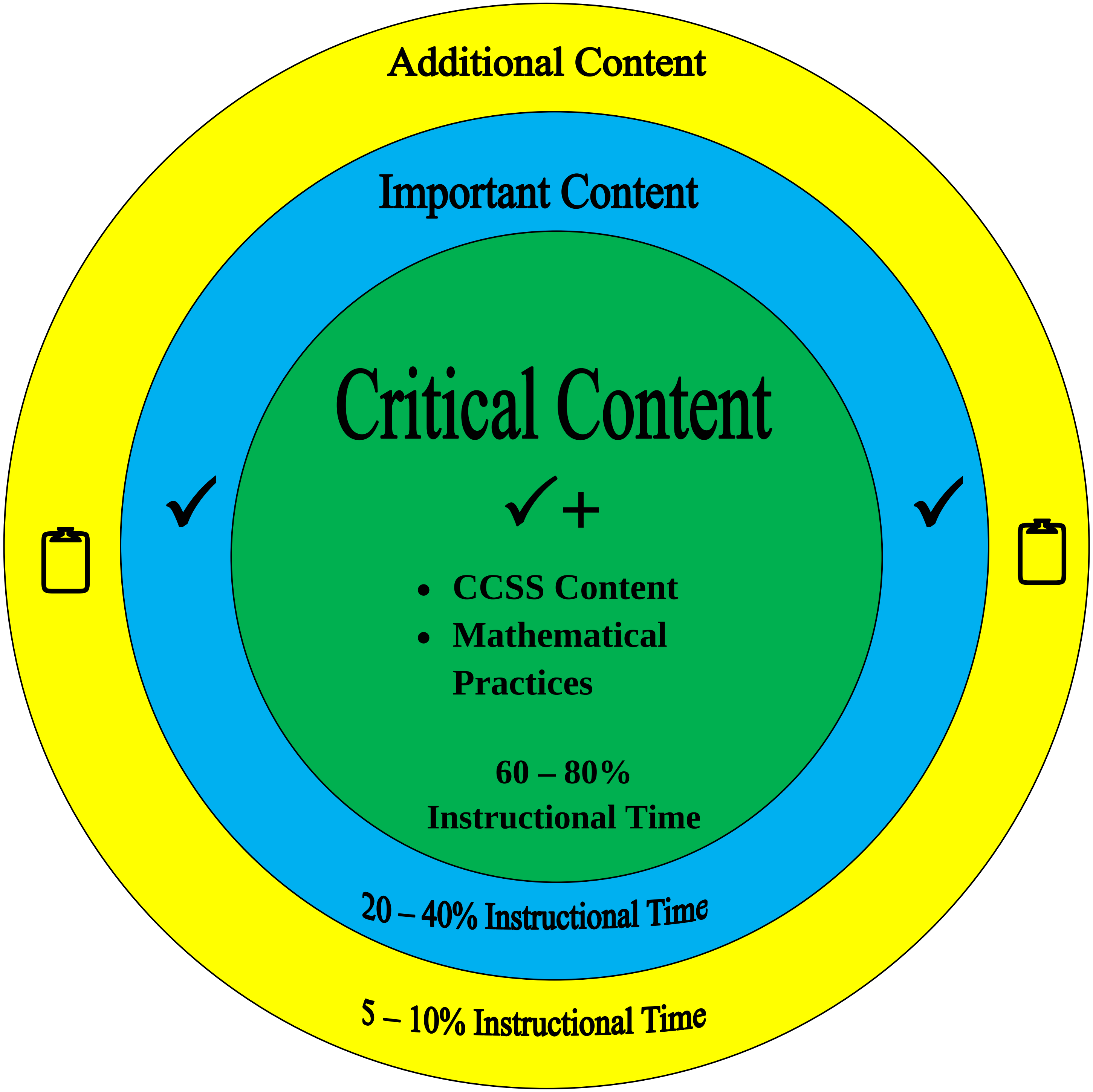
Emphasis on Instruction

The Assessment Guidance also communicates instructional priorities with regard to the CCSS. Specific content that has been identified as *essential* for building the foundational skills required in the CCSS is incorporated at each grade level. The OTL for this essential content only exists at the particular grade level in the school year designated. If essential content is not taught, students will experience a gap in learning. As there is risk to future learning if essential content is not taught and learned, it is important to note that **mastery of essential content is critical**. The instructional priorities play a key role in student success on the CCSS accountability assessments, known as the **Partnership for Assessment of College and Career Readiness (PARCC) Assessments**, which begin in 2014-15.

New for 2012-13

To assist teachers even more, the concentric circle graphic (similar to a bull's-eye) was created. This graphic displays the three levels of instructional priority. The highest priority, entitled ***Critical Content***, is indicated by the "✓+" symbol and ideally represents approximately 60-80% of instructional time. The middle priority, entitled ***Important Content***, is indicated by the "✓" symbol and represents approximately 20-40% of instructional time. The lowest priority, entitled ***Additional Content***, is indicated by the (📋) symbol and ideally represents approximately 5-10% of instructional time.

Instructional priorities related specifically to the CCSS have also been updated for 2012-13. This guidance focuses on CCSS foundational skills and Mathematical Practices. The guidance also includes "grayed-out sections" that are part of the major clusters in the PARCC *Model Content Frameworks*. These sections help to highlight the CCSS principles of focus and coherence. Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. At a minimum, teachers are expected to become familiar with these major clusters as Indiana transitions to the CCSS.


Additional Content
Important Content
Critical Content
✓+
CCSS Content
Mathematical Practices
60 – 80% Instructional Time
20 – 40% Instructional Time
5 – 10% Instructional Time

Instructional and Assessment Guidance 2012-13

Mathematics – Grade 3

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement	
3.1.1	✓+	3.2.1	✓+	3.3.1	✓+	3.4.1	✓	3.5.1	✓
3.1.2	✓+	3.2.2	✓+	3.3.2	✓+	3.4.2	✓	3.5.2	✓
3.1.3	✓+	3.2.3	✓+	3.3.3	✓+	3.4.3	✓	3.5.3	✓
3.1.4	✓+	3.2.4	✓+	3.3.4	✓+	3.4.4	📋	3.5.4	📋
3.1.5	✓+	3.2.5	✓+	3.3.5	✓+	3.4.5	✓	3.5.5	📋
3.1.6	✓	3.2.6	✓	3.3.6	✓+	3.4.6	✓	3.5.6	📋
3.1.7	✓	3.2.7	📋	3.3.7	✓	3.4.7	✓	3.5.7	📋
3.1.8	✓+	3.2.8	📋			3.4.8	✓	3.5.8	📋
3.1.9	📋					3.4.9	📋	3.5.9	✓+
3.1.10	✓+					3.4.10	📋	3.5.10	✓
3.1.11	✓							3.5.11	✓
3.1.12	📋							3.5.12	✓
3.1.13	✓								
3.1.14	📋								
3.1.15	✓								

There are similarities among the Indiana Academic Problem Solving Standards and Common Core State Standards for Mathematical Practice. These standards should be taught on a regular basis in connection with the content standards.

Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 3

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* ***Mathematical Practices*** *is imperative to ensure student success.*
- ***** *The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	Standard Text	Notes
3.OA.1	Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*	This aligns partially with IAS 3.2.2.
3.OA.2	Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*	This aligns partially with IAS 3.2.3.
3.OA.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	This aligns partially with IAS 3.2.2 and 3.2.3. See Pg 89 Table 2: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf
3.OA.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = ÷ 3, 6 × 6 = ?.*	*
3.OA.5	Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*	This aligns partially with IAS 3.3.4. The CCSS includes the distributive property. Students do not need to use formal terms for these properties.
3.OA.6	Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	*
3.OA.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	This aligns partially with IAS 3.2.4, 3.2.5 and 3.3.4. Sufficient practice and support throughout the year are needed to help students meet this fluency.

3.OA.8	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	*
3.OA.9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	*
3.NBT.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	This aligns well with IAS 3.2.1. Sufficient practice and support throughout the year are needed to help students meet this fluency.
3.NF.1	Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b*.	*
3.NF.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.	This aligns partially with IAS 3.1.9 and 3.3.7. The CCSS refers to understanding a fraction as a number and using a number line to represent fractions.
3.NF.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.* d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	This aligns partially with IAS 3.1.8 and 3.1.10. The CCSS includes the number line and symbols to compare fractions. Denominators are limited to 2, 3, 4, 6, and 8 in the Fractions domain of the Grade 3 CCSS.
3.MD.1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	*

3.MD.2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).6 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	This aligns partially with IAS 3.5.6 and 3.5.7. The CCSS excludes problems involving notions of "times as much". See Pg 89 Table 2: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf).
3.MD.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.	This aligns partially with IAS 3.5.1. The CCSS measures to the nearest quarter inch and includes data representation.
3.MD.5	Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	This aligns partially with IAS 3.5.4 and 4.5.5. The CCSS requires a more conceptual understanding of area.
3.MD.6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	This aligns partially with IAS 3.5.4.
3.MD.7	Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	This aligns partially with IAS 3.5.4, 4.5.4, 4.5.5 and 4.5.7.

Instructional and Assessment Guidance 2012-13

Mathematics – Grade 4

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement		Standard 6 Data & Prob.	
4.1.1	✓+	4.2.1	✓+	4.3.1	✓+	4.4.1	✓	4.5.1	✓	4.6.1	✓
4.1.2	✓+	4.2.2	✓	4.3.2	✓	4.4.2	✓	4.5.2	✓	4.6.2	✓
4.1.3	✓+	4.2.3	✓	4.3.3	✓	4.4.3	✓	4.5.3	✓	4.6.3	✓
4.1.4	✓+	4.2.4	✓+	4.3.4	✓	4.4.4	✓	4.5.4	✓		
4.1.5	✓+	4.2.5	✓+	4.3.5	✓	4.4.5	✓	4.5.5	📋		
4.1.6	✓+	4.2.6	✓+	4.3.6	✓+	4.4.6	📋	4.5.6	✓		
4.1.7	✓+	4.2.7	📋	4.3.7	✓+			4.5.7	✓		
4.1.8	✓+	4.2.8	✓+	4.3.8	✓			4.5.8	📋		
4.1.9	✓	4.2.9	📋					4.5.9	✓		
		4.2.10	✓					4.5.10	✓		
		4.2.11	📋								
		4.2.12	📋								

There are similarities among the Indiana Academic Problem Solving Standards and Common Core State Standards for Mathematical Practice. These standards should be taught on a regular basis in connection with the content standards.

Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 4

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* ***Mathematical Practices*** *is imperative to ensure student success.*
- ***** *The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	CCSS Text	Notes
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	*
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. *(Limit whole numbers less than or equal to 1,000,000)*	*
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	This aligns partially with IAS 4.3.1. The CCSSS includes solving multistep word problems and interpreting remainders.
4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*	This is **NEW** to 4^{th} grade.
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	This aligns partially with IAS 4.1.1 and 4.1.4. The CCSS includes expanded form and comparison of numbers less than or equal to 1,000,000.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.	This aligns partially with IAS 4.1.3. The CCSS includes rounding numbers less than or equal to 1,000,000 to any place.

4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	This aligns well with IAS 4.2.1. Sufficient practice and support throughout the year are needed to help students meet this fluency.
4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	This aligns partially with IAS 4.2.5. The expectation increases from multiplying numbers up to 100 by numbers up to 10 to multiplying numbers up to 4 digits by 1-digit numbers, and also multiplying two 2-digit numbers.
4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	This aligns partially with IAS 4.2.6. The expectation increases from dividing numbers up to 100 by numbers up to 10 without remainders to dividing up to 4-digit numbers by one-digit numbers with remainders.
4.NF.1	Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	*
4.NF.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	*

4.NF.3	Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	This aligns partially with IAS 4.1.5, 4.1.6, 4.1.7, 4.2.8. The CCSS requires addition and subtraction with mixed numbers, and solving word problems involving addition and subtraction of fractions.
4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?	This is **NEW** to 4th grade.
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.	This is **NEW** to 4th grade.
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.	This aligns well with IAS 4.1.8. The CCSS includes number representation on a number line.
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	This is **NEW** to 4th grade.

4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...	This aligns partially with IAS 4.5.2. The CCSS requires recording measurements in a table and includes various measurements.
4.MD.2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	This aligns partially with IAS 4.5.2, 4.5.9 and 4.5.10. The CCSS requires solving word problems involving various measurements.

Instructional and Assessment Guidance 2012-13

Mathematics – Grade 5

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement		Standard 6 Data & Prob.	
5.1.1	✓+	5.2.1	✓+	5.3.1	✓	5.4.1	✓	5.5.1	✓	5.6.1	✓
5.1.2	✓+	5.2.2	✓+	5.3.2	✓	5.4.2	✓	5.5.2	✓	5.6.2	✓
5.1.3	✓+	5.2.3	✓+	5.3.3	✓	5.4.3	✓	5.5.3	✓	5.6.3	✓
5.1.4	✓	5.2.4	✓+	5.3.4	✓	5.4.4	✓	5.5.4	✓+	5.6.4	✓
5.1.5	✓+	5.2.5	✓+	5.3.5	✓	5.4.5	✓	5.5.5	✓		
5.1.6	✓	5.2.6	📋	5.3.6	📋	5.4.6	✓	5.5.6	📋		
5.1.7	✓	5.2.7	📋	5.3.7	✓	5.4.7	✓	5.5.7	✓		
						5.4.8	📋				
						5.4.9	📋				

There are similarities among the Indiana Academic Problem Solving Standards and Common Core State Standards for Mathematical Practice. These standards should be taught on a regular basis in connection with the content standards.

Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 5

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* ***Mathematical Practices*** *is imperative to ensure student success.*
- ***** *The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	CCSS Text	Notes
5.NBT.1	Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	This aligns partially with IAS 5.1.3.
5.NBT.2	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	This is **NEW** to 5th grade.
5.NBT.3	Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	This aligns partially with IAS 5.1.1 and 5.1.3. The expectation increases from decimals to hundredths to decimals to thousandths.
5.NBT.4	Use place value understanding to round decimals to any place.	*
5.NBT.5	Fluently multiply multi-digit whole numbers using the standard algorithm.	This aligns well with IAS 5.2.1. Sufficient practice and support throughout the year are needed to help students meet this fluency.
5.NBT.6	Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	*
5.NBT.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	This aligns partially with 5.2.5 and 5.5.7. The CCSS includes multiplication and division with decimals to hundredths.
5.NF.1	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	*

5.NF.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.	This aligns partially with IAS 5.2.2. The CCSS emphasizes solving word problems.
5.NF.3	Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	*
5.NF.4a	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*	*
5.NF.4b	Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	This aligns partially with IAS 4.5.4 and 5.5.2. The CCSS emphasizes fractional side lengths.
5.NF.5	Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	*
5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	*

5.NF.7	Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3. b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	This aligns partially with IAS 5.2.3 and 5.2.4. The CCSS includes division of fractions by whole numbers and division of whole numbers by unit fractions which may be implied in IAS 5.2.4.
5.MD.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	This aligns partially with IAS 5.5.5. The CCSS includes conversions with various measurements and to use those conversions to solve multi-step, real world problems.
5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	This aligns partially with IAS 5.5.4. The CCSS requires a more conceptual understanding of volume.
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	This aligns partially with IAS 5.5.4.

5.MD.5	Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	This aligns partially with IAS 5.5.4.

Instructional and Assessment Guidance 2012-13

Mathematics – Grade 6

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement		Standard 6 Data & Prob.	
6.1.1	✓+	6.2.1	✓	6.3.1	✓+	6.4.1	✓	6.5.1	✓	6.6.1	✓
6.1.2	✓+	6.2.2	✓	6.3.2	✓+	6.4.2	✓	6.5.2	✓	6.6.2	✓
6.1.3	✓+	6.2.3	✓+	6.3.3	📋	6.4.3	📋	6.5.3	📋	6.6.3	✓
6.1.4	✓+	6.2.4	✓+	6.3.4	✓+	6.4.4	✓	6.5.4	✓	6.6.4	✓
6.1.5	✓	6.2.5	✓+	6.3.5	📋	6.4.5	✓	6.5.5	✓	6.6.5	✓
6.1.6	✓+	6.2.6	✓+	6.3.6	✓+	6.4.6	✓	6.5.6	📋	6.6.6	✓
6.1.7	✓	6.2.7	✓+	6.3.7	✓+	6.4.7	📋	6.5.7	📋		
		6.2.8	✓+	6.3.8	✓+			6.5.8	✓		
		6.2.9	📋	6.3.9	✓+			6.5.9	✓		
		6.2.10	📋					6.5.10	✓		

There are similarities among the Indiana Academic Problem Solving Standards and Common Core State Standards for Mathematical Practice. These standards should be taught on a regular basis in connection with the content standards.

Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 6

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* **Mathematical Practices** *is imperative to ensure student success.*
- ***** *The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	CCSS Text	Notes
6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	This aligns well with IAS 6.2.6.
6.RP.2	Understand the concept of a unit rate a/b associated with a ratio $a{:}b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*	This aligns partially with IAS 6.2.6. The CCSS includes unit rates.
6.RP.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations[1]. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	This aligns partially with IAS 6.1.4 – 6.1.6, 6.2.6 – 6.2.8, and 6.5.2. The CCSS includes unit rates, the use of tables and the coordinate plane with ratios, solving problems involving finding the whole given a part and the percent, using ratio reasoning to do measurement conversions, and manipulating and transforming units.
6.NS.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?*	This aligns well with IAS 6.2.4 and 6.2.5.

6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.	This aligns well with IAS 5.2.1. Sufficient practice and support throughout the year are needed to help students meet this fluency.
6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	This aligns well with IAS 5.2.5 and 6.2.3. Sufficient practice and support throughout the year are needed to help students meet this fluency.
6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	*
6.NS.6	Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	*
6.NS.7	Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.* b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write $-3\ ^0C > -7\ ^0C$ to express the fact that $-3\ ^0C$ is warmer than $-7\ ^0C$.* c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of –30 dollars, write $\lvert -30 \rvert = 30$ to describe the size of the debt in dollars.* d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.*	*
6.NS.8	Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	This aligns partially with IAS 6.3.7 and 6.3.8. The CCSS includes finding the distance between points.

6.EE.1	Write and evaluate numerical expressions involving whole-number exponents.	This aligns partially with IAS 6.3.3, 6.3.4 and 6.3.6. The CCSS includes expressions with exponents.
6.EE.2ab	Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.* b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.*	*
6.EE.2c	Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = s^3$ *and* $A = 6\ s^2$ *to find the volume and surface area of a cube with sides of length* $s = 1/2$.	This aligns partially with IAS 6.3.2 and 6.3.6. The CCSS includes whole number exponents.
6.EE.3	Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*	This aligns partially with IAS 6.3.6. The CCSS includes algebraic expressions.
6.EE.4	Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	This is **NEW** and it connects well with 6.EE.3.
6.EE.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	*
6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	This aligns well with IAS 6.3.1, 6.3.5, 5.3.1 and 5.3.2.
6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	*
6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	*
6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*	*

Instructional and Assessment Guidance 2012-13

Mathematics – Grade 7

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement		Standard 6 Data & Prob.	
7.1.1	✓	7.2.1	✓+	7.3.1	✓+	7.4.1	✓	7.5.1	✓+	7.6.1	✓
7.1.2	✓	7.2.2	✓+	7.3.2	✓+	7.4.2	✓	7.5.2	✓+	7.6.2	✓
7.1.3	✓	7.2.3	✓+	7.3.3	✓	7.4.3	✓	7.5.3	✓+	7.6.3	✓
7.1.4	✓	7.2.4	📋	7.3.4	✓+	7.4.4	📋	7.5.4	✓+	7.6.4	✓
7.1.5	✓	7.2.5	📋	7.3.5	✓			7.5.5	✓+	7.6.5	✓
7.1.6	✓			7.3.6	📋			7.5.6	📋	7.6.6	✓
7.1.7	✓			7.3.7	✓+					7.6.7	✓
				7.3.8	✓+						
				7.3.9	✓+						
				7.3.10	✓+						

There are similarities among the Indiana Academic Problem Solving Standards and Common Core State Standards for Mathematical Practice. These standards should be taught on a regular basis in connection with the content standards.

Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 7

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* **Mathematical Practices** *is imperative to ensure student success.*
- ***** *The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	CCSS Text	Notes
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*	This is **NEW** to 7th grade.
7.RP.2	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.	This aligns partially with IAS 6.2.7, 6.3.8, 7.3.6, 7.3.7, 7.3.9 and 7.3.10. The CCSS focuses on proportional relationships.
7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*	This aligns partially with IAS 7.2.2, 7.2.3 and 8.2.2.
7.NS.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.	This aligns partially with IAS 7.2.1.

7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	This aligns partially with IAS 7.1.7, 7.2.1, 8.1.2 and 6.1.4. Sufficient practice and support throughout the year are needed to help students meet the fluency of rational number arithmetic.
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.	*
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	This aligns partially with IAS 7.3.4. The CCSS includes factoring and rational coefficients.
7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	This is **NEW** and it connects well with the EE cluster.
7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*	This aligns partially with Indiana's 7th Grade Standards.
7.EE.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	This aligns well with IAS 7.3.1 and 7.3.2. Sufficient practice and support throughout the year are needed to help students meet the fluency of solving one-variable equations of the form $px + q = r$ and $p(x + q) = r$.

Instructional and Assessment Guidance 2012-13
Mathematics – Grade 8

Symbol	Content Priority	Approximate Instructional Time	Possible Test Questions	
			ISTEP+	Acuity
✓+	Critical	60 – 80%	Yes	Yes
✓	Important	20 – 40%	Yes	Yes
📋	Additional	5 – 10%	Assessed Locally	

Standard 1 Number Sense		Standard 2 Computation		Standard 3 Alg. & Functions		Standard 4 Geometry		Standard 5 Measurement		Standard 6 Data & Prob.	
8.1.1	✓+	8.2.1	✓	8.3.1	✓+	8.4.1	✓	8.5.1	✓	8.6.1	✓
8.1.2	✓	8.2.2	✓	8.3.2	✓+	8.4.2	📋	8.5.2	✓+	8.6.2	✓
8.1.3	📋	8.2.3	📋	8.3.3	✓+	8.4.3	📋	8.5.3	✓	8.6.3	✓
8.1.4	✓+	8.2.4	📋	8.3.4	✓+	8.4.4	✓	8.5.4	✓+	8.6.4	✓
8.1.5	✓+			8.3.5	✓+	8.4.5	✓+	8.5.5	✓	8.6.5	✓
8.1.6	✓+			8.3.6	✓+					8.6.6	✓
8.1.7	✓+			8.3.7	✓+					8.6.7	✓
				8.3.8	✓+						
				8.3.9	✓						
				8.3.10	📋						

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Common Core State Standards (CCSS)
2012-13 Instructional Priorities – Grade 8

- *The following content is essential for building the foundational skills required in the CCSS. Mastery of this content is critical to avoid gaps in student learning. In addition, a focus on the* ***Mathematical Practices*** *is imperative to ensure student success.*
- ** The* ***grayed-out sections*** *are part of the major clusters in the PARCC Model Content Frameworks. They help to highlight the CCSS principles of focus and coherence.* ***Teachers may choose to include this content in their curriculum either completely, by means of differentiation, or not at all. However, our expectation is that teachers at least become familiar with these major clusters as we transition to the CCSS.***

CCSS	CCSS Text	Notes
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	This aligns well with IAS 8.1.4, 8.1.5, and 8.3.3.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	This aligns partially with IAS 8.1.6, 8.1.7 and 7.1.3. The CCSS includes cube roots and this concept represented with equations.
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as* 3×10^8 *and the population of the world as* 7×10^9*, and determine that the world population is more than 20 times larger.*	*
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	*
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	This aligns partially with IAS 8.3.5, 8.3.6, 8.3.7, and 8.3.8. The CCSS includes interpreting unit rates (slope) and comparing two different proportional relationships.
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	This is a **NEW** concept. See Pg 12: http://commoncoretools.files.wordpress.com/2011/04/ccss_progression_ee_2011_04_25.pdf

8.EE.7	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	This aligns partially with IAS 8.3.1. The CCSS includes solving equations that include the use of the distributive property and equations that have infinite solutions and no solutions. In 7th Grade, students should have attained fluency with solving one-variable equations of the form $px + q = r$ and $p(x + q) = r$.
8.EE.8ab	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*	*
8.EE.8c	Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	This aligns partially with IAS 8.3.2. The CCSS includes solving real-world problems involving pairs of equations.
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	*
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*	This aligns partially with IAS 8.3.8. The CCSS includes comparing properties of two functions.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	*
8.G.1	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	This aligns partially with IAS 8.4.4, 7.4.1 and 7.4.2.
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	This aligns partially with IAS 8.4.4, 7.4.1 and 7.4.2.
8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	This aligns partially with IAS 8.4.4, 7.4.1 and 7.4.2.

8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two dimensional figures, describe a sequence that exhibits the similarity between them.	This aligns partially with IAS 8.4.4 and 7.5.2.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	*
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	This aligns partially with IAS 8.4.5. The CCSS requires a proof.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	*
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	This aligns partially with IAS 8.4.5. The CCSS includes finding the distance between points in a coordinate system using the Pythagorean Theorem.
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	***** This aligns well with IAS 8.5.4. "This content along with other grade 7 content, such as, angle measure, area, surface area, volume (7.G.4–6), proportional reasoning (7.RP), and multistep numerical problem solving (7.EE.3), can be combined and used in flexible ways as part of modeling during high school — not to mention after high school for college and careers." *PARCC Model Content Frameworks*